

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Mei Chen  
Serial No. : 10/687,715  
Filed : Oct. 17, 2003  
Title : Method and System for Estimating Displacement in a Pair of Images

Art Unit : 2624  
Examiner : Daley, Clifton G  
Confirmation No.: 4628

Commissioner for Patents  
P.O. Box 1450  
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APPEAL BRIEF

I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P., a Texas Limited Partnership having its principal place of business in Houston, Texas.

II. Related Appeals and Interferences

Appellant is not aware of any related appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-7 and 9-20, which are the subject of this appeal, are pending.

Claim 8 has been canceled.

Claims 1-7 and 9-20 stand rejected.

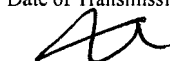
Appellant appeals all rejections of the pending claims 1-7 and 9-20.

CERTIFICATE OF TRANSMISSION

I hereby certify that this document is being transmitted to the Patent and Trademark Office via electronic filing.

April 23, 2008

Date of Transmission



(Signature of person mailing papers)

Edouard Garcia

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#### IV. Status of Amendments

The amendments filed October 8, 2007, have been entered and acted upon by the Examiner.

No amendments were filed after the final Office action dated January 23, 2008.

#### V. Summary of Claimed Subject Matter

##### A. Independent claim 1

The aspect of the invention defined in independent claim 1 is a method for estimating a displacement of an object (FIG. 1, wheel 10, 10'; page 7, lines 9-17) appearing in a first image (FIG. 1, reference image 14) and a second image (FIG. 1, target image 16). In accordance with this method, a respective candidate location of the object is ascertained in each of a plurality of search regions (e.g., search region 20 in FIG. 1 and search regions 22 in FIG. 4) in the second image (FIG. 2, block S-4; page 12, lines 13-18). For each of the search regions, a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image is determined (FIG. 2, block S-4; page 12, lines 7-23). A respective confidence value is associated with each of the candidate displacement vectors (FIG. 2, block S-5; pages 13, lines 2-13; page 17, lines 18-25). The estimated displacement of the object is provided based at least in part on an evaluation of the confidence values (FIG. 2, blocks S-6, S-7, S-8; page 14, lines 1-11; page 14, line 20 - page 15, line 8).

##### B. Dependent claim 10

Claim 10 depends from claim 1 and recites that "the ascertaining comprises performing an optical flow analysis to determine the respective locations of the object in the search regions" (see page 12, lines 7-13).

C. Independent claim 13

The aspect of the invention defined in independent claim 13 is a system for estimating a displacement of an object (FIG. 1, wheel 10, 10'; page 7, lines 9-17) appearing in a first image (FIG. 1, reference image 14) and a second image (FIG. 1, target image 16). The system includes an object displacement estimator (FIG. 4, block 14), a validity measurer (FIG. 4, block 16), and a validity comparator (FIG. 4, block 18). The object displacement estimator ascertains a respective candidate location of the object in each of a plurality of search regions (e.g., search region 20 in FIG. 1 and search regions 22 in FIG. 4) in the second image FIG. 2, block S-4; page 12, lines 13-18). For each of the search regions, the object displacement estimator determines a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image (FIG. 2, block S-4; page 12, lines 7-23). The validity measurer (FIG. 4, block 16) associates a respective confidence value with each of the candidate displacement vectors (FIG. 2, block S-5; pages 13, lines 2-13; page 17, lines 18-25). The validity comparator provides the estimated displacement of the object based at least in part on an evaluation of the confidence values (FIG. 2, blocks S-6, S-7, S-8; page 14, lines 1-11; page 14, line 20 - page 15, line 8).

D. Independent claim 17

Independent claim 17 defines apparatus for estimating a displacement of an object (FIG. 1, wheel 10, 10'; page 7, lines 9-17) appearing in a first image (FIG. 1, reference image 14) and a second image (FIG. 1, target image 16). The apparatus includes at least one data processing component that is operable to perform the following operations (FIG. 4, system 10; page 15, line 9 - page 17, line 5). A respective candidate location of the object is ascertained in each of a plurality of search regions (e.g., search region 20 in FIG. 1 and search regions 22 in FIG. 4) in the second image (FIG. 2, block S-4; page 12, lines 13-18). For each of the search regions, a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image is determined (FIG. 2, block S-4; page 12, lines 7-23). A respective confidence value is associated with each of the candidate displacement vectors (FIG. 2, block S-5; pages 13, lines 2-13; page 17, lines 18-25). The estimated displacement of

the object is provided based at least in part on an evaluation of the confidence values (FIG. 2, blocks S-6, S-7, S-8; page 14, lines 1-11; page 14, line 20 - page 15, line 8).

#### VI. Grounds of Rejection to be Reviewed on Appeal

A. Claims 1-7, 9, 11-20 stand rejected under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915).

B. Claim 10 stands rejected under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915) and Hanna (U.S. 2001/0019621).

#### VII. Argument

##### **A. Claims 1-7, 9, 11-20 stand rejected under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915)**

The Examiner has rejected claims 1-7, 9, 11-20 under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915).

##### 1. Applicable standards for sustaining a rejection under 35 U.S.C. § 103(a)

“A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. §103(a).

In an appeal involving a rejection under 35 U.S.C. § 103, an examiner bears the initial burden of establishing *prima facie* obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). To support a *prima facie* conclusion of obviousness, the prior art must disclose or suggest all the limitations of the claimed invention.<sup>1</sup> See In re Lowry,

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<sup>1</sup> The U.S. Patent and Trademark Office has set forth the following definition of the requirements for establishing a *prima facie* case of unpatentability (37 CFR § 1.56(b)(ii):

32 F.3d 1579, 1582, 32 USPQ2d 1 031, 1034 (Fed. Cir. 1994). If the examiner has established a *prima facie* case of obviousness, the burden of going forward then shifts to the applicant to overcome the *prima facie* case with argument and/or evidence. Obviousness, is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. This inquiry requires (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary consideration. See KSR Int'l Co. v. Teleflex Inc., No. 04-1350, slip op. at 2 (U.S. Apr. 30, 2007) (citing Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966)). If all claim limitations are found in a number of prior art references, the fact finder must determine whether there was an apparent reason to combine the known elements in the fashion claimed. See KSR, slip op. at 14. This analysis should be made explicit. KSR, slip op at 14 (citing In re Kahn, 441 F. 3d 977, 988 (CA Fed. 2006): “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

## 2. Independent claim 1

### a. Introduction

Independent claim 1 recites:

1. A method for estimating a displacement of an object appearing in a first image and a second image, comprising:  
ascertaining a respective candidate location of the object in each of a plurality of search regions in the second image;

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A *prima facie* case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

for each of the search regions, determining a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;

associating a respective confidence value with each of the candidate displacement vectors; and

providing the estimated displacement of the object based at least in part on an evaluation of the confidence values.

As explained in detail below, the rejection of independent claim 1 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn because (1) the Examiner has not shown that the cited references disclose each and every element of the claim, and (2) one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Minami in view of Toklu in the in a way that would arrive at the inventive subject matter defined by the claim.

b. The Examiner's position

In support of the rejection of claim 1, the Examiner has taken the following position (see § 2 on pages 2-3 of the final Office action):

- Minami discloses the “ascertaining” element of claim 1 in col. 3, lines 17-44;
- Minami discloses the “determining” element of claim 1 in col. 12, lines 25-41);
- “Minami does not teach associating a respective confidence value with each of the candidate displacement vectors;”
- Toklu teaches “associating a confidence value with a candidate location” in col. 10, lines 36-39; and
- “Minami in combination with Toklu discloses providing the estimated displacement of the object based at least in part on an evaluation of the confidence values” in col. 13, lines 7-9 of Minami.

c. Appellant's rebuttal: the cited references do not disclose each and every element of claim 1

The rationale given by the Examiner does not show that the cited references disclose each and every element of claim 1. In particular, the Examiner has acknowledged that Minami fails to disclose or suggest the “associating” element of claim 1 (see final Office action, page 3, second

¶: “Minami does not teach associating a respective confidence value with each of the candidate displacement vectors”). In an effort to make-up for this failure of Minami’s disclosure, the Examiner has argued that Toklu teaches “associating a confidence value with a candidate location” (final Office action, page 3, third ¶). Contrary to the Examiner’s assumption, however, the “associating” element of claim 1 does not recite “associating a confidence value with a candidate location.” Instead, the “associating” element of claim 1 recites “associating a respective confidence value with each of the candidate displacement vectors,” where the candidate displacement vectors relate respective candidate locations in the second image to the location of the object in the first image. “[A]ssociating a confidence value with a candidate location” does not constitute associating a respective confidence value with each of multiple candidate displacement vectors relating respective candidate locations of an object in a second image to the location of the object in a first image.

Thus, the Examiner has not shown that Toklu makes up for Minami’s failure to disclose the associating element of claim 1. For at least this reason, the rejection of claim 1 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn.

Moreover, Toklu does not in fact associate multiple confidence values to respective ones of multiple candidate displacement vectors determined for candidate object locations in the same image. Instead, Toklu assigns only a single respective confidence level of tracking to each frame (see, e.g., FIG. 1, col. 5, line 42 - col. 6, line 2; col. 6, lines 6-8; col. 9, lines 25-28; col. 10, lines 29-39).<sup>2</sup>

Since neither Minami nor Toklu discloses the “associating” element of claim 1, the Examiner’s proposed combination of Minami and Toklu would not include the “associating” element of claim 1 and therefore would not include each and every element of claim 1. For at least this additional reason, the rejection of claim 1 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn.

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<sup>2</sup> It is noted that the Examiner has misread Toklu’s teachings. In particular, Toklu does not calculate a confidence level of tracking for each reference template location. Instead, Toklu calculates an initial confidence level of tracking for the current frame based on the confidence levels of the reference frames (see col. 9, lines 25-30). Subsequently, Toklu updates the initial confidence level based on the single template location having the maximum correlation or minimum matching value (see col. 10, lines 29-39).

In addition, contrary to the Examiner's assertion, Minami does not disclose the "determining" element of claim 1 in col. 12, lines 41 (or anywhere else for that matter). In particular, in col. 12, lines 25-41, Minami expressly discloses that the narrow areas are successively searched until the search of the overall wide area is completed and a motion vector for the current template is determined (see col. 12, lines 36-43). Thus, contrary to the Examiner's assumption, Minami does not determine a respective candidate displacement vector for each of the narrow areas. Toklu does not make-up for the failure of Minami to disclose or suggest the "determining" element of claim 1.

Since neither Minami nor Toklu discloses the "determining" element of claim 1, the Examiner's proposed combination of Minami and Toklu would not include the "determining" element of claim 1 and therefore would not include each and every element of claim 1. For at least this additional reason, the rejection of claim 1 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn.

d. Appellant's rebuttal: one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Minami in the manner proposed by the Examiner

The Examiner has acknowledged that Minami does not disclose the "associating" element of claim 1 (see final Office action, page 3, second ¶). In an effort to make-up for this failure of Minami's disclosure, the Examiner has argued that (final Office action, page 3, fifth ¶):

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have associated Toklu's confidence value for a candidate location with Minami's candidate displacement vectors in order to get a more reliable result (Toklu: column 6, lines 6-8).

Contrary to the Examiner's statement, however, one skilled in the art at the time the invention was made would not have had any apparent reason to combine the teachings of Minami and Toklu in the proposed manner. The fact is that associating confidence values with the motion vectors disclosed in Minami would not serve any useful purpose whatsoever. In particular, for each chosen template, a single reference motion vector for the wide search area 12 is determined after searching all the narrow search areas 14, 15, 16, 17. All the reference motion



vectors then area combined into a final reference vector indicating movement of the overall image, where the final reference vector has a value that either is zero or is the average value or center value of the computed motion vectors (see col. 12, line 21 - col. 13, line 21; and col. 11, lines 34-57). Since the reference motion vectors determined for the different templates simply are combined into either an average value or center value, one skilled in the art would not have had any apparent reason to associate respective confidence values with these reference motion vectors.

For at least this additional reason, the rejection of claim 1 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn.

In addition, the Examiner has cited col. 6, lines 6-8, in support of the proposition that associating "Toklu's confidence value for a candidate location with Minami's candidate displacement vectors" produce "a more reliable result." In col. 6, lines 6-8, however, Toklu merely discloses that "The confidence level of tracking at each frame is the reliability measure of the template matching result." This disclosure merely describes the confidence level of tracking at each frame. The confidence level of tracking is used in Toklu's process to select the two reference frames that are used to process the current reference frame (see, e.g., col. 7, lines 40-59; FIG. 4). Since such a selection process is not used in Minami's method, the cited disclosure does not provide any support whatsoever for the Examiner's assertion that "a more reliable result" would be achieved by the Examiner's indeterminate combination of Minami and Toklu.

Instead of pointing to some teaching or suggestion in Minami, Toklu, or the knowledge generally available to support the proposed combination of Minami and Toklu, the Examiner has relied on circular reasoning. In particular, the Examiner's proffered motivation (i.e., because it would "...get a more reliable result") assumes the result (i.e., the modification of Minami's method) to which the proffered "motivation" was supposed to have led one skilled in the art. Such circular reasoning cannot possibly support a rejection under 35 U.S.C. § 103(a). Indeed, such circular reasoning only evidences the fact that the Examiner improperly has engaged in impermissible hindsight reconstruction of the claimed invention, using applicants' disclosure as a blueprint for piecing together elements from the prior art in a manner that attempts to reconstruct the invention recited in claim 1 only with the benefit of impermissible hindsight (see KSR Int'l Co. v. Teleflex Inc., slip op. at 17: "A factfinder should be aware, of course, of the distortion

caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.”). The fact is that neither Minami nor Turek nor the knowledge generally available at the time the invention was made would have led one skilled in the art to believe that there was any problem to be solved or any advantage that would be gained by the Examiner’s proposed modification of Minami’s disclosure.

Without any apparent reason for modifying Minami’s disclosure, the Examiner’s rationale in support of the rejection of claim 1 amounts to no more than a conclusory statement that cannot support a rejection under 35 U.S.C. § 103.

For at least these additional reasons, the rejection of claim 1 under 35 U.S.C. § 103(a) over Minami and Toklu should be withdrawn.

3. Claim 2-7, 9-12, and 18

Each of claims 2-7, 9-12, and 18 incorporates the elements of independent claim 1 and therefore is patentable over Minami in view of Toklu for at least the same reasons explained above.

4. Claim 13

Independent claim 13 recites

13. A system for estimating a displacement of an object appearing in a first image and a second image, comprising:
  - an object displacement estimator operable to
    - ascertain a respective candidate location of the object in each of a plurality of search regions in the second image, and
    - for each of the search regions, determine a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;
  - a validity measurer operable to associate a respective confidence value with each of the candidate displacement vectors;
  - and

a validity comparator operable to provide the estimated displacement of the object based at least in part on an evaluation of the confidence values.

Independent claim 13 recites elements that essentially track the pertinent elements of claim 1 discussed above. Therefore, claim 13 is patentable over Minami in view of Toklu for at least the same reasons explained above in connection with claim 1. In particular, the rejection of independent claim 13 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn because (1) the Examiner has not shown that the cited references disclose the validity measurer element of claim 13, and (2) one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Minami in view of Toklu to arrive at the invention defined in independent claim 13.

5. Claims 14-16 and 19

Each of claims 14-16 and 19 incorporates the features of independent claim 13 and therefore is patentable over Minami in view of Toklu for at least the same reasons explained above.

6. Claim 17

Independent claim 17 recites

17. Apparatus for estimating a displacement of an object appearing in a first image and a second image, comprising at least one data processing component operable to perform operations comprises:

ascertaining a respective candidate location of the object in each of a plurality of search regions in the second image;

for each of the search regions, determining a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;

associating a respective confidence value with each of the candidate displacement vectors; and

providing the estimated displacement of the object based at least in part on an evaluation of the confidence values.

Independent claim 17 recites elements that essentially track the pertinent elements of claim 1 discussed above. Therefore, claim 17 is patentable over Minami in view of Toklu for at least the same reasons explained above in connection with claim 1. In particular, the rejection of independent claim 17 under 35 U.S.C. § 103(a) over Minami in view of Toklu should be withdrawn because (1) the Examiner has not shown that the cited references disclose the “associating” operation element of claim 17, and (2) one skilled in the art at the time the invention was made would not have had any apparent reason to modify the teachings of Minami in view of Toklu to arrive at the invention defined in independent claim 17.

7. Claim 20

Claim 20 incorporates the elements of independent claim 17 and therefore is patentable over Minami in view of Toklu for at least the same reasons explained above.

**B. Claim 10 stands rejected under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915) and Hanna (U.S. 2001/0019621)**

The Examiner has rejected claim 10 under 35 U.S.C. § 103(a) over Minami (U.S. 6,380,986) in view of Toklu (U.S. 6,724,915) and Hanna (U.S. 2001/0019621).

Claim 10 incorporates the elements of independent claim 1. Hanna does not make-up for the failure of Minami and Toklu to disclose or suggest the elements of independent claim 1 discussed above. Therefore claim 10 is patentable over Minami in view of Toklu and Hanna for at least the same reasons explained above in connection with independent claim 1.

VIII. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

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Respectfully submitted,

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### CLAIMS APPENDIX

The claims that are the subject of Appeal are presented below.

Claim 1 (previously presented): A method for estimating a displacement of an object appearing in a first image and a second image, comprising:

ascertaining a respective candidate location of the object in each of a plurality of search regions in the second image;

for each of the search regions, determining a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;

associating a respective confidence value with each of the candidate displacement vectors; and

providing the estimated displacement of the object based at least in part on an evaluation of the confidence values.

Claim 2 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises determining the search regions based on search parameters selected from the group that consists of search region dimensions, motion model trajectory, search range and step size.

Claim 3 (previously presented): A method as defined in Claim 2, wherein determining the search regions comprises:

determining a range of displacement of the object between the first image and the second image;

selecting step size for traversing the range within the second image; and

determining the plurality of search regions within the second image based upon the selected step size and the selected range of displacement.

Claim 4 (previously presented): A method as defined in Claim 2, further comprising:

evaluating each of the confidence values with respect to a cutoff condition;  
in response to a determination that none of confidence values satisfies the cutoff condition, selecting at least one new search parameter and repeating the ascertaining, the determining of the respective candidate displacement vectors, and the associating based on the selected new search parameter.

Claim 5 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises determining the search regions such that adjacent ones of the search regions overlap one another.

Claim 6 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises determining the search regions such that the search regions lie along a path across the second image.

Claim 7 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises determining the search regions based on a selected step size.

Claim 8 (canceled)

Claim 9 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises performing a multiresolution analysis to determine the respective candidate object locations.

Claim 10 (previously presented): A method as defined in Claim 1, wherein the ascertaining comprises performing an optical flow analysis to determine the respective locations of the object in the search regions.

Claim 11 (previously presented): A method as defined in Claim 1, wherein the associating comprises for each of the candidate displacement vectors performing an image

reconstruction and correlation analysis based on the candidate displacement vector to determine the associated confidence value.

Claim 12 (previously presented): A method as defined in Claim 1, wherein the associating comprises for each of the candidate displacement vectors performing a residual error analysis based on the candidate displacement vector to determine the associated confidence value.

Claim 13 (previously presented): A system for estimating a displacement of an object appearing in a first image and a second image, comprising:

an object displacement estimator operable to

ascertain a respective candidate location of the object in each of a plurality of search regions in the second image, and

for each of the search regions, determine a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;

a validity measurer operable to associate a respective confidence value with each of the candidate displacement vectors; and

a validity comparator operable to provide the estimated displacement of the object based at least in part on an evaluation of the confidence values.

Claim 14 (previously presented): A system as defined in Claim 13, further comprising a search region generator operable to determine the search regions based on search parameters comprising search range and step size.

Claim 15 (previously presented): A system as defined in Claim 13, wherein the validity comparator is operable to evaluate each of the confidence values with respect to a cutoff condition.



Claim 16 (previously presented): A system as defined in Claim 15, further comprising a search region generator, wherein in response to a determination that none of confidence values satisfies the cutoff condition:

the search region generator is operable to select at least one new search parameter and determine new search regions in the second image based on the selected new search parameter;

the object displacement estimator is operable to

ascertain a respective new candidate location of the object in each of the new search regions, and

for each of the new search regions, determine a respective new candidate displacement vector relating the respective new candidate location of the object and a location of the object in the first image; and

the validity measurer operable to associate a respective new confidence value with each of the new candidate displacement vectors.

Claim 17 (previously presented): Apparatus for estimating a displacement of an object appearing in a first image and a second image, comprising at least one data processing component operable to perform operations comprises:

ascertaining a respective candidate location of the object in each of a plurality of search regions in the second image;

for each of the search regions, determining a respective candidate displacement vector relating the respective candidate location of the object and a location of the object in the first image;

associating a respective confidence value with each of the candidate displacement vectors; and

providing the estimated displacement of the object based at least in part on an evaluation of the confidence values.

Claim 18 (previously presented): A method as defined in Claim 1, wherein the providing comprises selecting the candidate displacement vector associated with a highest one of the confidence values as the estimated displacement of the object.

Claim 19 (previously presented): A system as defined in Claim 13, wherein the validity comparator is operable to select the candidate displacement vector associated with a highest one of the confidence values as the estimated displacement of the object.

Claim 20 (previously presented): Apparatus as defined in Claim 17, wherein the at least one data processing component is operable to select the candidate displacement vector associated with a highest one of the confidence values as the estimated displacement of the object.

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### EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 CFR §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by Appellant in the pending appeal. Therefore, no copies are required under 37 CFR § 41.37(c)(1)(ix) in the pending appeal.

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#### RELATED PROCEEDINGS APPENDIX

Appellant is not aware of any decisions rendered by a court or the Board that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal. Therefore, no copies are required under 37 CFR § 41.37(c)(1)(x) in the pending appeal.